

SOME OBSERVATIONS ON WILD BOAR (*SUS SCROFA*) AND ITS CONTROL IN SUGARCANE AREAS OF PUNJAB, PAKISTAN¹

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INTRODUCTION

In Punjab, the wild boar (*Sus scrofa*), lives principally in four types of habitat, (1) riverain 'belas' (*Saccharum spontaneum* and *S. munja* grasses), (2) canal side plantations (*Prosopis juliflora*, *Dalbergia sissoo* and *Acacia arabica*), (3) forest plantations (*Acacia* sp., *Dalbergia* and *Prosopis juliflora*) and (4) fields of mature sugarcane and other tall agricultural crops which afford sufficient shelter to wild boar.

The distribution of wild boar in Pakistan has been favoured during the past 30 years due to development and spread of irrigation and irrigated forest plantations which provide excellent cover to this animal. The absence of predation pressure due to vanishing of large carnivores — lions and tigers (Roberts 1977) and Muslim abhorrence towards wild pig have also contributed to their spread in Pakistan.

Development of sugar industry in the past has encouraged large scale cultivation of sugarcane crop in the country. This has also led to the proliferation of wild pigs and their damage to sugarcane crops. Mirza (1978) has estimated an annual loss of about Rs. 5,01,22,842.00

sustained to agricultural crops by wild pig in Faisalabad District alone.

In spite of the past reports on severe infestation of wild pigs and their losses to agricultural crops and forest nurseries in Pakistan, there is no authentic publication on the use of poison baits to check their population. Except for some preliminary information on the biology of wild pig in Pakistan (Taber 1964, Roberts 1977, Smiet *et al.* 1979) there have also been no previous study on the population dynamics of the pest. Inayatullah (1973) has given a good account of wild boar distribution in Pakistan.

Some of the pig control methods tried in the past in Pakistan were shooting, hunting by dogs, use of hog cholera virus, electric fences, announcement of bounties and some use of various insecticides. All these control methods did not bring any substantial reduction in the pig population.

STUDY AREA

Wild boar control trials were conducted in sugarcane fields at Chiniot in Sargodha District (31° 43' N, 72° 59' E) along the western side of River Chenab and at Manan Wala in Sheikhpura District (31° 47' N, 74° 15' E) on either side of Gogera Branch Canal. The main crops grown between the sugarcane fields were wheat (3-4 inch high), potato, sweet potato, peas and other vegetables.

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MATERIALS AND METHODS

Estimation of sugarcane damage:

Damage estimate of sugarcane crop was made in randomly selected 25 hectares plot each of the three mainly grown varieties, i.e. Triton, BL₄ and L₁₁₈. A transect line bisecting the field was established. After every 5 steps number of both damaged and undamaged canes within approximately a m² area along the transect was noted down.

Estimation of pig population:

Crude estimate of pig population living in the dense cover of sugarcane fields were made using the following formula:

$$\frac{M N}{O}$$

Where M = Number of wild pigs counted while feeding at the baiting stations at sun down on the last day of pre-treatment feeding.

N = Total area of sugarcane fields which on survey was found to be infested with wild boars.

O = Area of sugarcane fields, selected out of the total infested area, from where wild pigs were drawn out to feed at the baiting stations.

Bait and baiting stations:

Wild boars freely fed on various forms and combinations of cereal bait typically for 5 nights (Table 1). The bait was laid in 5-6 metres long and 25-30 cm deep mud plastered trenches excavated in the open between the sugarcane fields. The idea of laying the bait in rows was to offer equal chances to all pigs irrespective of their age, sex and strength to

feed at the baiting stations. This is because the pigs have intraspecific dominance hierarchy (Roberts, pers. comm.) and smaller and weaker males would be afraid to approach near the bait stations (Singer *et al.* 1981) unless it was carefully distributed in rows along shallow channels.

On the 6th night the pigs were fed on poison bait made in water solution of 1080 (*Sodium fluoroacetate*) and 1081 (*Sodium fluoroacetamide*) at 0.03% and 0.035% concentration, respectively. The activity index of the animals was determined on the basis of the bait intake on the last day of pretreatment and post treatment feeding undertaken for one night. The bait take was measured in the early morning and replenished in the evening.

Dead pigs were collected from the sugarcane fields. Some data on age, sex and reproduction were taken before burying them to avoid secondary effect of the poison on non-target wild life.

RESULTS

Pig population in the total sugarcane area of Chiniot and Manan Wala was respectively estimated to be 1063 pigs in 3237 hectares (32.2/km²) and 2037 pigs in 2832 hectares (72.1/km²).

The per cent damage in three varieties of sugarcane was: Triton 35.4%, BL₄ 8.3% and L₁₁₈ 6.7%. Triton was found to be more soft and sweet than the other two varieties.

Results of the trials are summarized in Table 1. There is gradual increase in the bait takes, the maximum being on the last day of pre-treatment feeding. The addition of molasses increases the bait intake. The wild boar activity reduced sharply by 100% on all but two baiting stations where it was 83.3% and 80%. Pig

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TABLE 1

RESULTS OF THE POISON BAITING TRIALS AGAINST WILD PIG (*Sus scrofa*) IN SUGARCANE FIELDS OF PUNJAB AREAS

Tehsil	Trial site	Bait	Consumption of pre-treatment bait, (kg)					Consumption of post treatment bait, (kg)	% reduction in activity index
			Day 1	Day 2	Day 3	Day 4	Day 5		
Chiniot	Chakbandi	Dry wheat	10	20	25	28	30	0	100%
	Lasla	Dry paddy	10	20	20	25	30	5	83.3%
	Waras	+ dry wheat							
	Lasla	Dry maize	5	12	20	30	32	0	100%
	Waras	+ dry wheat							
Manan Wala	Lasla	Dry maize							
	Waras	+ dry wheat + molasses	0	10	15	38	40	0	100%
	Chak 3	Boiled wheat + molasses	6	10	15	40	48	0	100%
	Baga Chak	Wet wheat + molasses	5	10	25	40	50	10	80%
Manan Wala	Wara Gabian	Wet wheat + molasses	1	8	15	50	55	0	100%
	Ittan* Wali	Boiled wheat + molasses	6	25	45	50	—	0	100%

* only place where 1081 was used.

behaviour on these two baiting stations, on query, was found to be disturbed by human presence near the baiting stations.

Out of the 124 dead pigs collected, 53 were males and 71 were females. The age ratio was 47 adults to 77 juveniles separated on the basis of body stripes (Diong 1973, Stegeman 1938). All the juveniles were maned. Most of the young were found lying near the adult females close to their bedding places made of dry grasses. No adult male was found near the juveniles or the adult females. Altogether, the number of adult females in the collection was significantly higher than the adult males ($x^2 = 9.4$; $P < 0.01$, 1 df, Sokal

and Rohlf 1969). In the juveniles, 40 were males and 37 were females indicating a nearly even sex ratio (Table 2).

TABLE 2

SEX RATIO OF ADULT AND JUVENILE WILD BOAR COLLECTED FROM THE SUGARCANE FIELDS OF PUNJAB

Place	Adult		Juvenile		Total
	Male	Female	Male	Female	
Chiniot	5	13 ^a	26 ^b	24	68
Manan Wala	8	21	14	13	56
Total:	13	34	40	37	124

a.b. Each with one black individual.

DISCUSSION

Inayatullah (1973) and Smiet *et al.* (1979) respectively estimated 27 pigs per sq. mile (10.4/km²) in Changa Manga forest, Punjab and 9.6 pigs per sq. mile (3.7/km²) in forest tracks of Thatta in southern Sind. Our estimates in sugarcane area are very high compared with the above estimates. These apparently high population estimates could be attributed to large scale immigration of wild pig from perpetual cover of forest, riverine 'belas' and canal side plantations into thick cover of sugarcane crop. The collection of all the dead pigs from within the sugarcane fields and presence of most of the adult females with juveniles just on or near the elaborate bedding places suggest that they had lived in sugarcane fields for quite some time before our poison baiting trials. Obviously, the sugarcane crops provide shelter to these animals only up to their harvest after which they seem to migrate again to their perpetual covers.

The wild pigs not only use sugarcane crop as protective cover but also cause heavy damage to it. Our damage estimate work showed that more soft and sweet varieties of sugarcane are comparatively much more vulnerable to pig attack.

The gradual increase in the consumption of plain grain suggests that the pigs are slowly assembling at the baiting stations, the maximum number being on the last day. The results of these trials indicate that 1080 (*Sodium fluoroacetate* (0.03%) with cereal grains and molasses, if used under strict supervision fol-

lowing pre-treatment feeding, can safely cause a sharp reduction in the wild pig populations living in undisturbed and restricted areas.

Significantly less number of adult males than adult females in the collection shows that the probably move greater distances and have larger seasonal home ranges than females (Singer *et al.* 1981).

62% of the total collection comprised of stripped and maned juveniles. The mane appears when the pig reaches the age of 1-2 months (Stegeman 1938). The stripes disappear when the young are 5 months old (Diong 1973). The presence of mane and stripes on the young therefore suggests that they were not less than 1-2 months and more than 5 months in age. Taking into account the collection month (December) of the juveniles and their possible range of age, they appeared to have been born some time between July and October-November. This is supported by Roberts (1977) who reported that most of the litters of wild pig in Pakistan are born between July and October when the vegetational cover is at its maximum due to monsoon. Even in India majority of reproduction of wild pig takes place shortly before and after the rains (Prater 1971).

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